

REMARKS

In the Official Action, claims 1-21 were rejected. Claims 22-29 were previously withdrawn from further consideration by the Examiner. By this response, claim 6 is amended to phrase the claim more conventionally, and claims 16 and 17 are amended to correct punctuation. The amendments are not made for reasons of patentability and do not alter the subject matter or scope of the claims. Upon entry of the amendments, claims 1-21 will be pending in the present application. The Applicant respectfully requests reconsideration of the pending claims in view of the following remarks.

Rejections Under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claim 6 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Applicant respectfully traverses this rejection.

The Examiner asserted, incorrectly, that the limitation of “two or more fused silica fiber optic cables within a protective metal sheath” is a new matter. To the contrary, Applicant respectfully directs the Examiner to page 9, line 31 to page 10, line 1, which states: “[i]n general, a suitable Raman fiber optic probe may be constructed by soldering metal coated, *fused silica fiber optic cables* into a protective metal sheath.” (Emphasis added). Thus, the written description clearly supports the subject matter of claim 6. Finally, it should be noted that claim 6 is amended to delete “two or more” in an effort to phrase the claim more conventionally. Again, the amendment is not made for reasons of patentability and does not alter the subject matter or scope of claim 6.

Rejections Under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 1-21 under 35 U.S.C. § 112, second paragraph, as being indefinite. In regard to claims 1, 3, 13, and 15 the Examiner specifically stated:

Regarding claim 1, “the catalyst system suitable for the oligomerization of olefin monomer” is indefinite since it is unclear which catalysts are considered to be suitable for the process?

Regarding claim 3, “the step of adjusting the olefin oligomerization process” is indefinite since it is unclear how the oligomerization process is adjusted. In other words, applicants should recite which parameters, such as pressure, temperature, concentration, feedstock, an specified parameter are adjusted.

...
Regarding first step (c) of claim 13, it is unclear where or when the first measurement is carried out.

Regarding second step (c) of claim 13 and claim 15, “at least one oligomerization condition” is indefinite since it is unclear which parameters are adjusted.

The Applicant respectfully traverses this rejection. With regard to rejections for indefiniteness under 35 U.S.C. § 112, second paragraph, the Federal Circuit has stated that: “[t]he test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification. If the claims, read in light of the specification, reasonably apprise those skilled in the art of the scope of the invention, § 112 demands no more.” *Miles Lab. Inc. v. Shandon Inc.*, 27 U.S.P.Q.2d 1123, 1126 (Fed. Cir. 1993); *see also Morton Int'l, Inc. v. Cardinal Chem. Co.*, 28 U.S.P.Q.2d 1190, 1194-95 (Fed. Cir. 1993); and *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 225 U.S.P.Q. 634, 641 (Fed. Cir. 1985).

Furthermore, the claims need only be as precise as the subject matter permits so as to reasonably apprise one skilled in the art as to their scope. *Hybritech Inc. v. Monoclonal*

Antibodies, Inc., 231 U.S.P.Q. 81, 94-95 (Fed. Cir. 1986); *see also Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 37 U.S.P.Q.2d 1609, 1617 (Fed. Cir. 1996). It is the role of the description, not the claims, to describe the invention. *Orthokenetics, Inc. v. Safety Travel Chairs, Inc.*, 1 U.S.P.Q.2d 1081, 1088 (Fed. Cir. 1986). The second paragraph of §112 requires only that the recited parameter be easily obtainable by one skilled in the art, not that all possible permutations or alternatives be listed in the patent, much less the claims. *Id.* Indeed, M.P.E.P. § 2173.04 has recognized this principle and instructs that the *breadth* of a claim is not to be equated with indefiniteness.

Turning first to claim 1, the Examiner asserted that the phrase “catalyst system suitable for oligomerization of olefin monomers” is indefinite because it is unclear what catalysts are suitable for the process. The Applicant respectfully contended, however, that one skilled in the art would readily comprehend what a catalyst system suitable for oligomerization of olefin monomers comprises. In addition, the Applicant respectfully referred the Examiner to page 1, lines 30-33 and page 12, lines 26-33 of the application which discusses examples of suitable catalyst systems. Additional support can be found on page 13, lines 1-10 of the application. The Applicant concluded that, when claim 1 is properly read in view of the description as a whole and the cited passages in particular, one of ordinary skill in the art will readily ascertain whether any particular catalyst system would be suitable.

The Examiner found Applicant's remarks unpersuasive, stating:

The argument that applicant believe (sic) that when claim 1 is properly read in view of the description as a whole one of ordinary skill in the art will readily ascertain whether any

particular catalyst system could be suitable is not persuasive since there are many different kinds of catalysts used in the industry. These different catalysts are known to be used for oligomerization and catalysts which until the time of this invention are known able (sic) to be used for the oligomerization process. These un-known oligomerization catalysts are not disclosed by the specification. If so, clearly these catalysts cannot be decided. Therefore, the term "suitable catalyst" makes the oligomerization catalysts indefinite.

Applicant draws the Examiner's attention to *Orthokenetics, Inc. v. Safety Travel Chairs, Inc.*, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986). In *Orthokenetics*, the claim in question contained a limitation requiring that a wheelchair part be "so dimensioned as to be insertable through the space between the door frame of an automobile and one of the seats." The court ruled that this recitation was not impermissibly indefinite. The court stated that the phrase "so dimensioned" is as accurate as the subject matter permits. Indeed, the court correctly concluded that as long as those of ordinary skill in the art realized that the dimensions could be easily obtained, § 112, second paragraph, requires nothing more. The court further noted that the patent law does not require that all possible links corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone that they be listed in the claims.

Clearly, the recitation in the present claim 1 is quite similar to the recitation in the *Orthokenetics* case. A catalyst system *suitable* for the oligomerization of olefin monomers may depend on the types of monomers, reactor, reaction conditions, and so forth, employed in the particular oligomerization. Those of ordinary skill in the art are well aware of such suitable catalyst systems, especially in light of the specification.

The Examiner is reminded that the Manual of Patent Examining Procedure acknowledges the holding of the *Orthokenetics* case. M.P.E.P. § 2173.02 (citing *Orthokenetics, Inc.*, 1 U.S.P.Q.2d at 1088). In discussing the *Orthokenetics* case, the M.P.E.P. gives an example of a claim having the phrases “such as” and “*suitable* liquid.” § 2173.02 (emphasis added). The M.P.E.P. directs that if one of ordinary skill in the art is able to ascertain the meaning of the term “suitable liquid” in light of the specification, then a rejection under 35 U.S.C. §112, second paragraph is not appropriate. *Id.* Similarly, for a “catalyst system suitable for oligomerization of olefin monomers,” as presently claimed, a rejection under §112, second paragraph is also not appropriate.

Further, Applicant emphasizes that a “catalyst system suitable for oligomerization of olefin monomers,” as presently claimed, may indeed read on suitable catalyst systems of the future, which are currently unknown or not yet developed, but will be known in the future by those of ordinary skill in the art. In general, it is common for patentable subject matter to encompass unforeseeable embodiments. Indeed, even under the doctrine of equivalents, the Supreme Court has carved out an exception to prosecution history estoppel for *unforeseeable* equivalents. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 62 U.S.P.Q.2d 1705 (2002) (holding that the patentee may overcome the presumption of estoppel by demonstrating that the equivalent would have been unforeseeable at the time of the claim amendment). Applicant asserts that the possible existence of suitable catalyst systems in the future that are currently unknown does not render claim 1 indefinite. In sum, Applicant respectfully submits that claim 1 is not indefinite for the reasons asserted by the Examiner.

In regard to claim 3, the Examiner indicated that the phrase “the step of adjusting the olefin oligomerization process” is indefinite for failing to recite which parameters are adjusted. The Examiner made a similar rejection in regard to claims 13 and 15, which each claim recites “at least one oligomerization condition.” The Applicant respectfully contended that one of ordinary skill in the art would understand what types of adjustments may be made to an oligomerization process in response to the referenced output signal, particularly when the claims at issue are properly read in the context of the description. The Applicant cited page 6, lines 21-24 and page 13, line 29 through page 14, line 2 of the application. For example, the application states that the oligomerization process may be adjusted in response to the Raman output signal by “adjusting the amount within the reaction mixture of at least one of the reactants or oligomers or the catalyst system.” Page 6, lines 21-24.

The Examiner, however, found Applicant’s remarks unconvincing, stating:

The argument that one of ordinary skill in the art will understand what types of adjustment may be made to an oligomerization process in response to the referenced signal when the claims are properly read in the context of the description is not convincing since similarly there are many different parameters which affect the process and which do not affect to (sic) the same at all. These must be identified before they are used to adjust. Therefore, the claim is indefinite.

Applicant respectfully emphasizes that the specification plainly supports the recitation in claims 3, 13, and 15. The claim limitations of “the step of adjusting the olefin oligomerization process” and “at least one oligomerization condition” are unmistakably discussed in the specification. For example, the specification clearly explains that the amount of reactants or oligomers in the reaction mixture, as well as, the amount of reactants or diluent added to the

reactor, may be adjusted in response to the output signal or spectrum generated by the Raman assembly. *See* page 6, lines 21-24 and page 13, line 29 through page 14, line 2. The specification also mentions that the operation of the reactor stirrer, as well as, the reactor temperature and reactor pressure, may be controlled automatically or manually in response to the spectrum produced by the Raman device. *Id.* As the Federal Circuit held in the *Orthokenetics* case, a claim need not “describe” the invention because such description is provided by the specification. Accordingly, Applicants respectfully submit that claims 3, 13, and 15 are not indefinite for the reason asserted by the Examiner.

Regarding claim 13, the Examiner has raised similar concerns which appear to relate to claim breadth, not indefiniteness. In particular, the Examiner stated that “it is unclear where or when the first measurement is carried out.” Applicant contended that one of ordinary skill in the art would understand upon reading the specification, particularly page 14, lines 3-7 and page 18, lines 4-19, that the first measurement may be made before, during, or after oligomer formation, and it may be carried out within the reaction zone, or in an inlet or outlet to the reaction zone, for example. This aspect of the technique is properly described *in the description* section of the application and need not comprise a recitation of the claim, as noted in the case law cited herein, so long as one of ordinary skill in the art would understand the claim’s scope when read in view of the description.

Again, the Examiner found Applicant’s remarks unpersuasive, stating that “[t]he argument of the indefiniteness of claim 13 is maintained since it is unclear what (sic) the first one is measured such as the size of the reactor or the size of the catalyst.” Applicant respectfully

requests that the Examiner clarify this statement, because it is readily apparent that the claim 13 is directed toward measuring the concentration of monomer, and not to measuring the size of the reactor or the size of the catalyst.

The Applicant believes that the Examiner's rejections of claims 1, 3, 13, and 15 are improperly based upon the breadth, not the indefiniteness, of the claim language. In particular, the Applicant believes that one of ordinary skill in the art, upon reading the description, would readily ascertain the meaning of the passages rejected by the Examiner. In support of this position, the Applicant notes that, despite the Examiner's position regarding the indefiniteness of claims 1, 3, 13, and 15, the Examiner has simultaneously issued an obviousness rejection of these claims. While M.P.E.P. § 2173.06 permits such simultaneous rejections in some circumstances, in those circumstances the Examiner is required to point out how the alleged indefinite language is being interpreted, which the Examiner has failed to do in the present Official Action. The Applicant considers this a strong indication that the phrases are indeed sufficiently definite and that the scope of the claims is readily ascertainable by the Examiner, as well as one of ordinary skill in the art, and that the claims in question are instead being improperly rejected for breadth. Therefore, in view of the present amendments, the well established case law cited herein, the instruction of the M.P.E.P. to not equate breadth with indefiniteness, and the failure of the Examiner to provide a reasonable basis for why one of ordinary skill in the art would be unable to understand the scope of the claims at issue, the Applicant respectfully requests reconsideration and withdrawal of the present rejection under 35 U.S.C. §112, second paragraph.

Rejections under 35 U.S.C. § 103

The Examiner rejected claims 1-21 under 35 U.S.C. § 103(a) as being unpatentable over Long et al. (6,479,597). Specifically, the Examiner stated:

Long discloses a polymerization process of olefins such as *ethylene* in the presence of a catalyst. The concentrations of reactor constituents are monitored in-situ and adjusted according to measurements which are made possible by Raman Spectroscopy (the abstract; figures 1, 2, 4, 9, 11, 12, 13, 16; col. 4, lines 10-11, 40-45, and 60-65).

Long does not disclose that the polymerization is an oligomerization which is known as a kind of polymerization producing polymers having larger product (see the entire patent for details. However, it is known that the molecular weight of the polymer depends on the degree of the polymerization.

It would have been obvious to one having ordinary skill in the art who wishes to produce oligomers at the time the invention was made to have modified the Long process by selecting appropriate degree of polymerization to produce oligomers such as hexane from trimerization of *ethylene* to arrive at the applicants' claimed process if hexane [sic] is desired.

(Emphasis added).

The Effective Date of the Long Reference is July 28, 2000

Initially, Applicant contends that the effective date of the Long reference is the later non-provisional filing date (July 28, 2000) and not the earlier provisional filing date (July 30, 1999) for two reasons. The first reason is specific to the current § 103 rejection and the second reason applies, in general, to *any* § 103 rejection.

As for the first reason, the Examiner in rejecting the present claims relies on the information in the Long reference that describes the use of Raman spectroscopy in the polymerization of the olefin *ethylene* to *polyethylene*. This information regarding polyethylene production, however, was added to the Long reference on the non-provisional filing date July 28, 2000, and thus the effective date of the Long reference as prior art can be no earlier than July 28, 2000. It should be emphasized that the Long provisional application is solely directed to the use of Raman spectroscopy in the polymerization of the olefin *propylene* to *polypropylene*. See the true and correct copy of the Long provisional application attached as Exhibit 1. The information regarding polyethylene relied upon by the Examiner was not added until the Long non-provisional application was filed on July 28, 2000. See the true and correct copy of the Long non-provisional application attached as Exhibit 2, specifically Figs. 10-16 and associated text. Because the Long provisional application does not contain this disclosure, it is axiomatic that the effective date of the Long reference as utilized by the Examiner can be no earlier than July 28, 2000.

As for the second reason, the Applicant further asserts that July 28, 2000 (the non-provisional filing date), and not July 30, 1999 (the provisional filing date), is the effective filing date of the Long reference as prior art *in any § 103 analysis*. This is so because new claims were added in the non-provisional application that were not supported by the earlier provisional application, and thus, the effective date of the Long reference is the non-provisional filing date. *See In re Wertheim*, 209 U.S.P.Q. 554, 564 (C.C.P.A. 1981) (holding that if subject matter set forth in the claims of the reference do not contain appropriate support in the earlier related

application, the effective date of the reference is the actual filing date, which is the filing date of the application having the appropriate support).

In general, a continuation-in-part application, i.e., an application containing new matter, such as the Long non-provisional application filed on July 28, 2000, is entitled to the filing date of the parent application as to all subject matter carried over into it from the parent application, whether for purposes of obtaining a patent or subsequently utilizing the patent disclosure as evidence to defeat another's right to a patent. *In re Lund*, 153 U.S.P.Q. 625, 630-31 (C.C.P.A. 1967). In *In re Wertheim*, 209 U.S.P.Q. 554 (C.C.P.A. 1981), the question arose as to how far back can one extend the effective date of a reference patent as "prior art" in a case where the patent reference is used in a rejection under 35 U.S.C. §§ 102(e)/103. *Id.* at 561. Even more specifically, the C.C.P.A. answered the following question: "What patent disclosure, or portion thereof, which has been 'carried over' through a chain of applications, may be traced back to an earlier application and given its effective date...to reject later filed claims under §§ 102(e)/103?" *Id.* at 561-62.

In answering this question, the *Wertheim* court recognized that Supreme Court precedent expressed the rationale behind treating U.S. applications as prior art as of their filing date under Section 102(e). The Supreme Court stated that but for the delay imposed by the Patent Office in processing the application, the disclosure would become public as of the filing date. *See Id.* 559-61 (citing *Alexander Milburn Co. v. Davis-Bournonville Co.*, 270 U.S. 390 (1926) and *Hazeltine Research, Inc. v. Brenner*, 382 U.S. 252 (1965)). The C.C.P.A. extended this reasoning to a continuation-in-part application. Because a continuation-in-part application adds new matter to

the previously filed parent application, the type of new matter added must be inquired into to determine whether it is critical to the patentability of the claimed invention. *Id.* at 563. If the new matter is critical to the patentability of the claimed invention, a patent could not have issued on the earlier filed application, so the theory of patent office delay has no application for the earlier filed application. *Id.* If the PTO wishes to utilize against an applicant a part of a patent disclosure found in an application filed earlier than the date of the application which became the patent, it must demonstrate that the earlier-filed application contains support under 35 U.S.C. §§ 112 and 120 for the invention claimed in the reference patent. *Id.* at 564. “For if a patent could not theoretically have issued the day the application was filed, it is not entitled to be used against another.” *Id.* Thus, if the subject matter set forth in any of the claims of the reference patent do not contain appropriate support under 35 U.S.C. §§ 112 and 120, the effective date of the reference is its actual filing date, not the filing date of an earlier related application. *Id.* at 565.

Here, at least claims 16, 17, and 19 of the Long reference were added in the later non-provisional application filed July 28, 2000 and are directed to the use of Raman spectroscopy in the polymerization of ethylene to polyethylene. Specifically, claims 16 and 17 are directed to Raman measurement of ethylene concentration, and claim 17 is also directed to Raman measurement of an alpha-olefin (e.g. hexene), a comonomer typically used in polyethylene production and not polypropylene production. Claim 19 is directed to Raman measurement of diluent concentration, a reactor component commonly used in polyethylene production but not in polypropylene production. In fact, in polyethylene production, diluent, such as isobutane, is generally the greatest concentration component in the polyethylene reactor. In contrast, diluent is not used in polypropylene production, but instead the olefin monomer propylene itself acts as

the diluent. Because the Long reference contains claims that are only supported by the new matter introduced in the non-provisional application filed on July 28, 2000, the effective date of the Long reference as prior art *must* be July 28, 2000.

Removal of the Long Reference Under 37 C.F.R. § 1.131

As mentioned, the Examiner rejected the present claims under § 103 (a) as being unpatentable over the Long reference. In view of the earlier date of invention of the subject matter disclosed and claimed in the present application, however, Applicant has chosen to remove the Long reference pursuant to 37 C.F.R. § 1.131. Under Rule 131, an applicant may overcome a prior art rejection by filing an appropriate declaration that establishes invention of the claimed subject matter by the applicant prior to the effective date of the reference relied upon in the rejection. Prior invention may be shown either by proving an actual reduction to practice prior to the effective date of the reference (here July 28, 2000, as discussed above), or by proving conception of the invention prior to the effective date of the reference coupled with due diligence from prior to the effective date of the reference to either an actual or constructive reduction to practice.

Here, the present claims are generally directed to oligomerization in a reactor of at least one olefin monomer with a catalyst system. The reaction is monitored by using Raman spectrometry equipment to provide an output signal representative of one or more chemical components of the reaction. Such monitoring may include, for example, measurement of olefin monomer concentration(s). Moreover, oligomerization conditions may be adjusted.

The Applicant has attached as Exhibit 3 a Declaration signed by the Applicant, the sole inventor of record, which demonstrates that the invention disclosed and claimed in the present application was actually reduced to practice before July 28, 2000, the non-provisional filing date and the effective date of the Long reference. In paragraphs 3 and 4 of the attached Declaration, Applicant Battiste states that he conceived of the claimed subject matter at least as early as July 19, 1999 and that he actually reduced to practice the claimed subject matter at least as early as August 11, 1999. These statements are corroborated by Exhibits A and B of the Declaration.

Specifically, in Exhibit A attached to the Declaration, the laboratory notes of Applicant Battiste, dated at least as early as July 19, 1999, are entitled "Low-Resolution Raman Project" and "Measurement of LRR Spectra of Cyclohexane/Hexene Blends with Ethylene Added." Applicant Battiste's conception of the claimed subject matter is evidenced by the calibration of the Raman spectrometer in preparation of an actual reduction to practice of the claim subject matter. Exhibit A, pages 18-21. Blend concentrations of reaction components, such as ethylene, cyclohexane, isobutane, butane, hydrogen, hexene, and decene, are measured in a hexene reactor with a Raman spectrometer. *Id.* The Raman device is calibrated, for example, by comparing the Raman spectra analyses against conventional gas chromatograph analyses. *Id.* at 18-19. Furthermore, various oligomerization conditions are adjusted, for example, by changing reaction component feed rates and reactor concentrations, and by changing the reactor pressure. *Id.* at 18-21.

In Exhibit B attached to the Declaration, the laboratory notes of Applicant Battiste, dated at least as early as August 11, 1999, are entitled, "Reaction at 85 °F Conversion of C₂= to C₆=" and "Second Reaction Monitoring C₂= to C₆= with R-2000." The notes demonstrate oligomerization in

a reactor of olefin monomer ethylene with a catalyst system to give hexene product. Exhibit B, pages 23-25. The reaction is monitored by using Raman spectrometry equipment to provide an output signal representative of one or more chemical components of the reaction. *Id.* at 24-25. For example, the concentration of ethylene and hexene in the reactor are measured with the Raman device. *Id.* Furthermore, oligomerization conditions, such as the reactor catalyst concentration, are adjusted. *Id.* at 24.

Applicant has demonstrated that the invention disclosed and claimed in the present application was actually reduced to practice before the effective non-provisional date (July 28, 2000) of the Long reference, and thus, the Long reference should be removed pursuant to 37 C.F.R. § 1.131. Accordingly, Applicant respectfully requests that all rejections based on the Long reference be withdrawn and that claims 1-21 be allowed.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of claims 1-21. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

General Authorization for Extensions of Time

In accordance with 37 C.F.R. § 1.136, Applicants hereby provide a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefor. Furthermore, Applicant authorizes the Commissioner to charge the appropriate fee as

well as any additional fees which may be currently due to the credit card listed on the attached PTO-2038. However, if the PTO-2038 is missing, if the amount listed thereon is insufficient, or if the amount is unable to be charged to the credit card for any other reason, the Commissioner is authorized to charge Deposit Account No. 06-1315; Order No. CPCM:0008/FLE (33938US).

Respectfully submitted,

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